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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,767	08/08/2006	Guillaume Becard	0509-1107	4666

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YOUNG & THOMPSON
209 Madison Street
Suite 500
Alexandria, VA 22314

EXAMINER

PARA, ANNETTE H

ART UNIT	PAPER NUMBER
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1661

NOTIFICATION DATE	DELIVERY MODE
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08/30/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

Office Action Summary	Application No. 10/588,767	Applicant(s) BECARD ET AL.	
	Examiner ANNETTE H. PARA	Art Unit 1661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-44 is/are pending in the application.
- 4a) Of the above claim(s) 31-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claims Pending

Claims 23-44 are pending. Claims 23-30 will be examined on the merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The rejection is different from the rejection over Gianimazzi-Pearson in view of each of Nagashi et al. and Safir et al. and further in view of Mangnus et al. set forth in the Office action mailed March 24, 2010 as applied to claims 23-30.

Claims 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buee et al. (MPMI Vol. 13, No.6 2000, pp.693-698 The American Phytopathological Society) in view of Nagahashi et al. (Partial separation of root exudate components...Mycol. Res. 104 (12):1453-1464 December 2000) and Safir et al. (U.S. Patent 5,002,603 1991), and further in view of Mangnus et al. (J. Agric. Food Chem. 1992, 40, 1230-1235).

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The claims are drawn to a method of treating *Gigaspora rosea* fungi comprising contacting said fungi with GR24 in at least an amount that is suitable for stimulating the development and/or growth of said fungi. Where the *Gigaspora rosea* fungi are in the form of spores, on mycorrhizated root fragments, on a constitutive root part of a plant capable of forming a symbiosis with AM fungi, on at least one whole host plant cultivated in a pot, or on at least one whole host plant cultivated in the field.

Buee et al. teach treating spores of *Gigaspora rosea* fungi with a branching factor purified from plant root exudates.

Buee et al. fail to teach treating mycorrhizated root fragments, a constitutive root part of a plant capable of forming a symbiosis with AM fungi, a whole host plant cultivated in a pot, or a whole host plant cultivated in the field. Gianinazzi-Pearson et al. also fail to teach treating with strigol analogue GR24. However,

Nagahashi et al. teach treating *Gigaspora rosea* fungi with root exudates wherein the fungi are on roots, seedlings.

Safir et al. teach treating VAM fungi with root exudates on a plant in the field. (column 7) or in a pot (column 12).

Mangnus et al. teach using strigol analogue GR24 on *Orobanche* and *Striga* seed.

At the time the invention was made, it would have been obvious to modify the method of Buee et al. by using strigol analogue GR24. One of ordinary skill in the art would have been motivated to use GR24 because it is a chemical analogue of strigolactones found in root exudates and because it is commercially available. Furthermore, one of ordinary skill in the art would have been motivated to use GR24 in view of the results obtained by Mangus et al. One of ordinary skill in the art would have treat mycorrhizated root fragments, a constitutive root part of a plant capable of forming a symbiosis with *Gigaspora rosea* fungi, a whole host plant cultivated in a pot, or a whole host plant cultivated in the field fungi in view of the result obtained by Nagahashi et al. and Safir et al.

Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Summary

No claim is allowed.

Answer to Applicants' argument

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Applicant's arguments filed June 24, 2010 have been fully considered but are not found persuasive.

Applicants argue that MANGNUS describes the ability of GR24 to promote the germination of seeds of two weeds - *Striga hermonthica* and *Orobancha crenata*. These plants are described as parasitic weeds which cause severe damage to graminaceous and leguminous crops in tropical and subtropical areas (see, Introduction). The teachings of MANGNUS cannot be applied to a method of treating arbuscular mycorrhizal fungi, such as *Gigaspora*. The present application relates to AM fungi and the symbiotic interaction between a plant and a fungus. In contrast, MANGNUS relates to a parasitic interaction between two plants. One of ordinary skill in the art of the invention (the biology of symbiosis between plants and fungi) would not have considered the teachings of MANGNUS, which specifically apply to the growth of the parasite plants *Orobancha* and *Striga*. *Plants* (*Orobancha*) and fungi (*Mycota*) are phylogenically so far away from each other that the taxonomic classification separates them into two Kingdoms, namely the *Plantae* kingdom including the organisms which are autotrophic according to the carbon source and, the *Fungi* kingdom including the organisms which are heterotrophic according to the carbon source, *Striga* and *Orobancha* are parasites of plants whereas AM fungi are symbionts of plants.

This is not found persuasive because *Orobancha spp.* are holoparasites and acquire all nutrients and water from their host through a root connection. The *Striga spp.* Are hemiparasites but although they have chlorophyll and a basal photosynthetic activity, they basically also behave as holoparasites. It has been found that the life cycles of *Striga* and *Orobancha* are very similar, and a number of mechanisms ensure the coordination of the parasites' life cycles to that of their host. The important steps in the life cycle are germination, radicle growth to the host root. The interaction between host and parasite begins with the secretion of secondary metabolites from the roots of the host that induce the germination of the parasite seeds. Most of the germination stimulants have been identified in the root exudates of host and are described as strigolactones. VAM symbiosis is a very ancient plant-microbe association. The influence of plant exudates on VAM has been well recognized. *Orobancha spp.*, *Striga spp.*, and VAM depend on host plant to survive. The interaction between parasite and host, and VAM and host, begins from the secretion of root exudates of the host plant. At the time of the invention was made it would have been obvious to use GR24 as root exudates in view of the results obtained by Mangus et al.

Future Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Annette H. Para whose telephone number is (571) 272-0982. The examiner can normally be reached Monday through Thursday from 5:30 a.m. to 4:00 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached at (571) 272-0975. The fax number for the organization where the application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Annette H Para/
Primary Examiner